Thus the graph expressing the $r_p$'s, which is much smoother than that of the $u$'s, may be used to read off the character of the natural periods of the $u$'s; further various relationships are found between the amplitude of the corresponding terms in the Fourier periods and those of the correlation coefficients.

The analysis is illustrated by applying it to the quarterly values of pressure at Port Darwin, a key center of world weather, which proves to have a strong persistence and to show evidence of not very strongly developed periods of about 34½ months and of about four times this length or 11½ years; the series of data is not long enough to settle whether the former oscillations are damped and are free oscillations, but the latter appear to be imposed from without and are presumably solar in origin.

### WULF AND MELVIN ON THE EFFECT OF TEMPERATURE UPON THE ULTRA-VIOLET BAND SPECTRUM OF OZONE AND THE STRUCTURE OF THIS SPECTRUM

The ultra-violet absorption of ozone in the region 3400–2300 Å consists of a large number of bands appearing against a background of continuous absorption. The effect of temperature upon this spectrum has been studied over the range −78° to 250° C. A definite though small effect has been observed. Grossly it manifests itself as an increase in contrast with decreasing temperature. Photometric results show this to be chiefly a decrease in absorption between the band edges, all of the bands appearing to come from normal vibrational levels of very low if not the lowest energy. Though somewhat diffuse, the bands tend to degrade to the red. The observed influence of temperature can be explained as the decrease of intensity in the higher rotational absorption of the bands, and possibly also in the continuous background, with decreasing temperature. Discontinuities in the intensity relations and the regular spacing of certain of the bands have led to a partial vibrational analysis indicating two active vibrational degrees of freedom in the excited electronic state. The observed change in the absorption with temperature may effect somewhat the estimates which have been made of the amount of ozone existing in the upper atmosphere.—(*Bulletin of the American Physical Society, Program of the Washington Meeting, April 16, 1931, volume 6, No. 2, page 42.*)

### FATHER E. GHERZI, S. J., ON THE WINDS AND UPPER AIR CURRENTS ALONG THE CHINA COAST AND IN THE YANGTSE VALLEY [1]

The publication under review comes from the well known observatory of Zi-Ka-Wei, near Shanghai, organized more than half a century ago and operated in the interest of meteorology with special application to storm warnings for navigators of the adjacent seas. The present publication has its special appeal to navigators of the air in the Far East.

The upper air data available to Father Gherzi are far too few to afford definite reuslts; nevertheless those at hand in connection with the movement of the clouds and the surface winds, statistics of which are abundant, enable the author to present a picture of free air conditions that is of much value in air navigation.

His pilot-balloon material consists of ascents made at Chefoo by the U. S. S. *Jason* in May, June, July, August, and September, 1928; pilot-balloon ascents were also contributed by H. M. S. *Argus* at Shanghai made in October, November, and December, a few ascents in each month. These ascents though few in number serve to indicate the direction and force of the winter monsoon winds along the China coast. As might be expected these winds are due essentially to the presence and the intensity of the so-called Siberian cold season anticyclone; the center of which may be over the Province of Shantung in China, rather than in Siberia. Father Gherzi concludes that for winter monsoon days the winds aloft back with increase in altitude above the surface. Data for the summer monsoon are much too few to permit the drawing of definite conclusions. Conditions during the summer monsoon are much less ready than during the winter monsoon.

The statistical data of surface winds are given in very great deatil for a number of stations on the China coast. The 240 quarto pages comprised in the report are mostly taken up with data of cloud movement and surface air movement printed in detail for a number of years of record. Appropriate charts and diagrams add to the interpretation of the statistics. The price of the work is $4.50.—*A. J. Henry.*

[1] The winds and upper air currents along the China coast and in the Yangtse Valley Zi-Ka-Wei Observatory, Shanghai, 1931.

### RESULTS OF RAINFALL OBSERVATIONS IN WESTERN AUSTRALIA [1]

The present volume is the fifth of a series published by the bureau. Volumes for Victoria (1910), N. S. Wales (1914), Queen Island and South Pacific (1913), South and North Australia (1917) have already been published. The last volume, discussing Tasmania, is under preparation. As soon as the series is completed supplementary volumes are to be published to bring the early issues up to date.

The present volume contains a concise history of the rainfall and weather of western Australia, from the time records began up to the end of 1927. A few of the records go back as far as 1877 and even earlier. The number of stations is 1,374.

The work contains a written tabular history of rainfall by months from 1877 to 1926; a short note on the climate of western Australia; a discussion of the relationships between wheat yield and rainfall; a record of notable meteorological events in the State, e. g., auroræ australis, bush fires, earthquakes, floods, etc. These occupy half of the volume. The second part of the volume contains the annual rainfall data of all stations in western Australia. At the end of the volume annual rainfall maps for western Australia from 1886 to 1927 are published, and also a revised annual rainfall map of Australia.

This publication is valuable to all those interested in the climate of western Australia, but especially to agriculturists and sailors. It lacks a thorough discussion of the rainfall and weather but it is an excellent source book containing the available data and written history of the weather in western Australia. Especially valuable are the numerous maps and charts included in the 387 pages of text.—*Sigismond R. Diettrich.*

[1] Results of rainfall observations made in western Australia, Commonwealth of Australia, Bureau of Meteorology, under the direction of H. A. Hunt, Commonwealth meteorologist, 1929, p. 387.

### PROF. ALEXANDER McADIE RETIRES FROM BLUE HILL OBSERVATORY

After sabbatical leave for the first semester of the coming academic year, Alexander McAdie, Abbot Lawrence Rotch professor of meteorology, Harvard University, and director of Blue Hill Observatory, will become professor emeritus.

In recognition of his long and distinguished service and his notable contributions to man's knowledge and understanding of the weather, a dinner was given Professor McAdie on June 11 by the Harvard visiting committee to Blue Hill Observatory, and a silver bowl was presented to him and Mrs. McAdie as a token of the committee's affection. Professor and Mrs. McAdie will make their home at Hampton, Va.—(*Bulletin American Meteorological Society August-September, 1931, p. 158.*)

## BIBLIOGRAPHY

C. FITZHUGH TALMAN, in charge of Library

### RECENT ADDITIONS

The following have been selected from among the titles of books recently received as representing those most likely to be useful to Weather Bureau officials in their meteorological work and studies:

**American geophysical union.**
Twelfth annual meeting. Transactions. April 30 and May 1, 1931. Washington, D. C. Washington. 1931. 229 p. figs. 25 cm.

**Beaugé, ———.**
Contribution à l'étude des relations de la météorologie et de l'océanographie. p. 1052–1063. figs. 27½ cm. (Bull. Soc. d'océan. de France. 11e année. 15 mars, 15 mai 1931.)

**Crestani, Giuseppe.**
Climatologia. Torino. 1931. xi, 359 p. figs. 27½ cm. (Trat. ital. d'igiene, dir. Oddo Casagrandi. Monografia 17a.)

**Eredia, Filippo.**
Cenni sulle condizioni termiche della regione italiana, nei riguardi dell'irrigazione. Roma. 1931. 12 p. fig. 25½ cm. (Estr.: Le irrig. in Italia. Pub. no. 8 del Serv. idrog. II ed.)

**Froc, L.**
History of the code of Zi-ka-wei. 4 p. chart (fold.) 31½ cm. (Report presented by Rev. F. L. Froc at conference of directors of meteorological stations of the Far East, held at Hong Kong at the end of April, 1930.)

**Gherzi, E.**
Winds and the upper air currents along the China coast and in the Yangtse valley. Shanghai. 1931. 2,240 p. plates. 31½ cm.

**Gorton, A. F.**
Significance of cylical characteristics in long range weather forecasting. p. 10–11, 27. 26 cm. (Citrus leaves, Aug. 1931.)

**[Great Britain.] Air ministry.**
Manual of air pilotage. London. 1930. xviii, 248 p. illus. maps (fold.) 23 cm. (Air pub. 1234.)
Report of the R. 101 inquiry . . . London. 1931. 129 p. figs. maps (fold.) front. 24½ cm.

**Gunness, C. I.**
Meteorological records. A forty-year summary, 1889–1928. p. 209–226. 23 cm. (Mass. agr. exper. sta. Bull. no. 270. Dec. 1930.)

**Kendrew, Wilfrid George.**
Climate, a treatise on the principles of weather and climate. Oxford. 1930. x, 329 p. illus. plates. diagrs. 22½ cm.

**Knowlton, H. E., & Dorsey, M. J.**
Study of the hardiness of the fruit buds of the peach. 28 p. illus. 23 cm. (Agr. exper. sta., coll. of agric. West Va. Univ. bull. 211. Dec., 1927.)

**Mangin, Arthur.**
L'air et le monde aérien. 3. éd., entièrement refondue d'après les travaux scientifiques les plus récents . . . Tours. 1877. 574 p. illus. plates. 24½ cm.

**Montanari, D.**
Sulla determinazione di correnti verticali per mezzo di palloni piloti. Roma. 1931. 10 p. figs. 24½ cm. (Estr.: L'Aerotecnica. v. 11, N. 3. Marzo 1931 IX.)

**Monterin, U[mberto.]**
Ricerche sull'ablazione e sul deflusso glaciale nel versante meridionale del Monte Rosa. Roma. 1931. 75 p. figs. plate (fold.) 27 cm. (Uff. idrog. del Po. Pubb. N. 10. Fasc. 6°.)

**Petitjean, L.**
Le temps et la prévision du temps en Algérie et au Sahara. Paris. 1930. 71 p. figs. maps (fold.) 24 cm. (1830–1930 coll. du cent. de l'Algérie. Études scient. Serv. mét. de l'Algérie.)

**Richardson, Burt.**
Evaporation as a function of insolation. p. 996–1019. 23 cm. (Amer. soc. civil engin. Trans. v. 95, 1931.)

**Skeete, C. C.**
West Indian hurricanes. p. 178–185, 206–210. figs. 28 cm. (Tropical agric., v. 8, no. 7–8, July–Aug. 1931.)

**Terada, Torahiko, & Utigasaki, Tyokurô.**
Physical investigations of conflagrations in Tokyo. p. 69–90. figs. 26½ cm. (Sci. papers Inst. phys. & chem. res. v. 16, Aug. 1931.)

**Tutton, A. E. H.**
High Alps; a natural history of ice and snow. London. [1931.] xvi, 319 p. figs. plates. 22½ cm.

**Watanabe, M., & *others*.**
Report on the cloud observations made at the Mera meteorological observatory, Mera, near Tokyo. April 1927 to March 1929. Tokyo. 1931. 50, 72 p. figs. plates. 31 cm.

## SOLAR OBSERVATIONS

### SOLAR RADIATION MEASUREMENTS DURING JULY, 1931

By HERBERT H. KIMBALL, Solar Radiation Investigations

For a description of instruments employed and their exposures, the reader is referred to the January, 1931, REVIEW, page 41.

Table 1 shows that solar radiation intensities averaged above the normal intensities for July at Madison, and close to the July normals at Washington and Lincoln.

Table 2 shows an excess in the total radiation received on a horizontal surface as compared with the normal amounts for July at Madison and Fresno, and a deficiency at all other stations for which normals have been computed.

Skylight polarization measurements obtained on 8 days at Madison, give a mean of 60 per cent with a maximum of 70 per cent on the 24th. At Washington, measurements obtained on 4 days give a mean of 53 per cent, with a maximum of 58 per cent on the 27th. These are close to the corresponding July averages for both stations.

TABLE 1.—*Solar radiation intensities during July, 1931*

[Gram-calories per minute per square centimeter of normal surface]

**Washington, D. C.**

| Date | Sun's zenith distance | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 8 a.m. | 78.7° | 75.7° | 70.7° | 60.0° | 0.0° | 60.0° | 70.7° | 75.7° | 78.7° | Noon |
| | 75th mer. time | Air mass | | | | | | | | | Local mean solar time |
| | | A. M. | | | | | P. M. | | | | |
| | e. | 5.0 | 4.0 | 3.0 | 2.0 | [1]1.0 | 2.0 | 3.0 | 4.0 | 5.0 | e. |
| | *mm.* | *cal.* | *cal.* | *cal.* | *cal.* | *cal.* | *cal.* | *cal.* | *cal.* | *cal.* | *mm.* |
| July 8 | 17. 37 | | | | 0. 72 | | | | | | 18. 59 |
| July 11 | 14. 10 | | | 0. 78 | 0. 99 | 1. 26 | | | | | 10. 97 |
| July 14 | 19. 23 | | | | 0. 82 | 1. 14 | | | | | 20. 57 |
| July 15 | 17. 96 | | | | 0. 74 | | | | | | 17. 96 |
| July 22 | 13. 61 | | | | 1. 09 | 1. 32 | | | | | 13. 13 |
| July 23 | 13. 61 | | | 0. 78 | 0. 99 | 1. 17 | | | | | 13. 61 |
| July 25 | 13. 13 | | | 0. 76 | 0. 98 | 1. 25 | | | | | 8. 81 |
| July 27 | 16. 79 | | 0. 63 | 0. 80 | 1. 00 | 1. 18 | | | | | 10. 97 |
| July 28 | 18. 59 | | | | 0. 82 | 1. 14 | | | | | 14. 60 |
| July 29 | 19. 89 | | | 0. 84 | 0. 88 | | | | | | 14. 60 |
| Means | | | (0. 63) | 0. 79 | 0. 90 | 1. 21 | | | | | |
| Departures | | | −0. 04 | +0. 02 | ±0. 00 | +0. 02 | | | | | |

[1] Extrapolated.